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A PRE-LENAPE SITE IN NEW JERSEY

BY

E. W. HAWKES AND RALPH LINTON

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FOREWORD

The investigation which forms the subject of this Memoir was undertaken at the instance of Mr. George L. Harrison, Jr., who generously provided the funds for the purpose. The actual excavation, which occupied the summer of 1915, was done in person by Dr. E. W. Hawkes and Mr. Ralph Linton, and the preparation of this report is their joint work.

During the progress of the digging, the site was visited by Prof. Amos P. Brown of the University of Pennsylvania, who studied the geological conditions and who has given us the benefit of his observations. According to Prof. Brown, there are indications that the yellow sand is a wind-borne deposit laid down upon the layer of white glacial sand, and though its age is not clearly defined, it must be of considerable antiquity.

The publication of this paper is due to the generosity of Mr. Eckley B. Coxe, Jr., President of the Museum.

G. B. GORDON,
Director of the Museum.

April 1, 1916.

A PRE-LENAPE SITE IN NEW JERSEY

There are few regions in North America which are of greater interest archeologically than the North Atlantic seaboard, as throwing light on the possible antiquity of man in America. Beginning with the much disputed palcoliths of Abbot, which may or may not represent glacial man, we pass to the so-called argillite culture, which is characterized by the exclusive use of this material and the entire absence of pottery, and from this period to the culture of the recent Lenape of Pennsylvania and New Jersey, represented by well-chipped implements and the manufacture of pottery. In the excavations made in the vicinity of Trenton by Volk, these three culture levels were found conforming to three geological strata: a surface black loam, in which the recent implements were found; a layer of yellowish sand of varying depth, in which occurred the crude implements of the argillite users; and the underlying glacial gravel, where the paleoliths are said to have been found. A similar arrangement of the strata, with the exception that the gravel was replaced by white glacial sand overlying cretaceous marl, was found in the site excavated by the authors. The location of the excavation, which is about fifteen miles south of Trenton in an air line, and about six miles from the Delaware makes it fall well within the region of the earlier investigations. As in the sites excavated by Volk, the modern implements were found in a surface stratum of leaf mold, but the argillite implements were found at the bottom of the yellow stratum, lying on the white glacial sand. A few scattered points of argillite exhibiting better workmanship and less signs of decay, were found in the yellow soil in a

position intermediate between the ancient level and the modern. This level also contained a few sherds of very crude pottery, quite distinct in material from that found on the surface. The intermediate points although showing an advance in technique, were related in material and form to those of the lowest level, and taken in connection with the beginnings of pottery, may indicate a stage of culture intermediate between that of the lowest level and the modern Lenape. The presence of a large number of bannerstones in the caches of the lowest level in connection with ceremonial points of argillite, precludes any such antiquity as that claimed for the "Dweller of the Yellow Soil" by Volk,¹ although they fall in the same intermediate period between glacial man and the modern Lenape, but evidently at a later date.

Our classification, based on the material excavated, begins with argillite implements, and passes through an intermediate period to the works of the modern Indian, whereas in the classification of Volk argillite represent the intermediate period between glacial man and the present Lenape. Our material leaves the question of glacial man untouched, while offering a possible link between argillite users and the modern Indian.

Volk's description of the dweller of the yellow soil offers so many points in common with our observations on the material from the lowest level, that we quote it here. Dr. Volk's work, extending over a period of twenty-two years, was characterized by such extreme patience and care that we feel no question as to its scientific accuracy.

"The existence of the Dweller of the Yellow Soil who lived on the drift underlying the black, during its progress of making and after its final drying off, previous to the accumulation of the black soil above by the decaying vegetation—has now been firmly established; this in spite of the fact that the traces of his existence are far less numerous than those of the black soil dweller following him.

¹ Volk claims that the traces of man in the yellow soil are pre-Indian. See *Archæology of the Delaware Valley*, Ernest Volk, Papers of the Peabody Museum, Vol. V, p. 108.

"The implements of the yellow drift man must, however, have been fairly numerous judging from the numbers of specimens and from the many chips scattered throughout the drift. These implements were of two or three distinct types: the spear-head, and possibly the arrow-head, the implements with a jagged cutting edge, and the drill-like specimen found with one of the heaps of human bones. The material of these was always argillite.

"The pits found at different depths with the charcoal and the pebbles broken by fire indicate that cooking was done.

"The finding of pieces of pigment in the undisturbed stratum of coarse whitish sand was of more than ordinary interest as such a discovery is thus far unique for this locality.

"The skeletons found show that these people were strongly built; the skulls and other bones were so far decomposed as to make it impossible to gather any further information.

"The habitation of this Dweller of the Yellow Soil has given him the name of the Man of the Intermediate Period, and his use of argillite in the manufacture of his implements gives him that of the Argillite man."¹

Beginning with the implements from the lowest level, our excavation furnished not only the types of points described by Volk, but a number of others, which are described later in detail. This diversity of types, in connection with the finely worked bannerstones, indicates that the culture of argillite users in this locality had become fairly well specialized.

Fire pits of varying size were also found at the lowest level, the largest marking the ceremonial center around which the caches had been deposited. Smaller pits, outside the circle of caches, where the soil furnished scattered implements, may have marked the camp. In every case these pits extended down into the white sand and were in no way connected with

¹ *Archæology of the Delaware Valley*, Ernest Volk, Papers of the Peabody Museum, Vol. V, 1911, pp. 125-126.

the upper strata.¹ Many fire-cracked stones marked the vicinity of the fire pits, but there were no other signs of cooking.

Three pieces of pigment were found in the yellow soil, two of red ochre and one which left a greenish stain. Several specimens in the caches were coated with red paint which came off in a fine scale when they were exposed to the air. The red stain, however, persisted on several specimens, notably the painted fossils found in caches.

Only fragments of bone were found, and these were always associated with two point caches, and evidently represented offerings rather than food. They were so badly broken and decayed as to make identification difficult, but a paleontologist to whom they were shown recognized in one the leg bone of a wild turkey and thought the others belonged to either deer or bear.

The resemblance of the implements figured by Volk, Plate CXVIII, to the points from our lowest level (see Plate XVII) is striking. Compare also the specimen figured in Plate CXIX with the blunt pear-shaped axe in Plate XVIII, A (found in cache B 5).

A number of chipped rejects, similar to those figured by Volk in Plate CXVI were scattered in the yellow soil, but in the presence of so much better material they are not described here.

In conclusion, the material from our lowest and intermediate levels agrees with that of Volk's Dweller of the Yellow Soil in geological position, but appears to belong to a later period within that time.

The lower village revealed by Mercer's excavation at Lower Black's Eddy,² where he found two stages of occupancy, also offers interesting comparisons with our types from the lowest level. The "fish spear" type, seen in Fig. 28, page 29,

¹ The pits described by Volk were of two kinds; those which extended to the surface and those which were entirely within the yellow layer.

² The Antiquity of Man in the Delaware Valley and the Eastern United States, Henry C. Mercer. Publications of the University of Pennsylvania, Vol. VI, 1897.

of Mercer's monograph may be compared with the fish spears in Plate XVII, I, J, K, L.

In our excavation, however, this was not the dominant form, the "diamond-shaped" point being most numerous. The occurrence of two potsherds at this level may mark the beginnings of pottery, as in our intermediate level. No jasper was found in our excavations in either the lowest or intermediate levels, but the predominance of argillite (427 to 7) in Mercer's lower village layer, and the presence of a small quartzite blade and worked quartzite pebbles, links his finds with ours as far as material is concerned.

The material from which the specimens at the lower level were made came from the river drift and not from the adjacent quarries, according to Mercer. "As to the quarries, granted that they were connected with the blade-thinning work-shops, the presence of these shops on the upper layer and surface, and their absence on the lower layer, would indicate that the quarries, with all the cultural significance that they involve, belong to the time of the upper layer only, and that the people of the lower site, obtaining their material from the neighboring beaches, had not known or worked them." Whether the argillite users of our lowest level obtained their material from river drift in the same way, or from the quarries around Trenton cannot be determined. The frequency with which inferior material was used, and the manner in which the few rejects had been made available by secondary chipping, seems to indicate that material was scarce.

Mercer, in considering the question whether the people of the lower village were forerunners of the Lenape of the upper village, has had resource to the legends of that people, as preserved by Heckwelder (*Indian Nations*, p. 51) and the *Walum Olum*, or *Painted Stick Chronicle*.

"The latter curious record, whose authenticity is tolerably well established, places eleven chiefs between the arrival of the Lenape in the Delaware Valley and the coming of white man (say Hudson, in 1609); and if we give twenty years to

a chief's reign, the date of their first coming would have been about 1387. This agrees with what a Lenape told the Reverend Charles Beatty in 1767 (*Journal of a Two Months' Tour West of the Alleghany Mountains*, Charles Beatty, p. 27, London, 1868). When counting beads on a wampum belt as years, according to a tribal custom, he said that his people had come to the Delaware 370 years before, or in 1397.

"The Heckwelder version of the tradition, however, which gives no means of fixing dates, would infer that the new comers found the country vacant. The exploring parties of the eastward migrating tribe, it says, arriving at the Susquehanna, followed it down to the Chesapeake Bay, then ascended the bay and outer seacoast and discovered the Delaware River, New Jersey, and the Hudson River—a country abounding in game, fruits, and fish, "and with no enemy to be dreaded."

"This seeming absence of prior occupants in the new country is again suggested by the Walum Olum, which refers to the newly discovered land as "a land free from snakes (enemies), a rich land, a pleasant land."¹

"But without attempting to dwell too much on these traditions and their claim that the Lenape only arrived in the Delaware Valley five hundred years ago, and that before that time it had lain uninhabited for an unknown period, suffice it to say that at Lower Black's Eddy we have found two stages of occupancy.

"The layers prove a difference in time, short or long. The character of the objects found a difference in handiwork. Future work can alone prove whether this difference denotes a mere accident of varying tribal conditions, or a wide-spreading difference in cultural status. Let us only say now that at this one spot it exists."

Since the work of Mercer, several finds of exclusively argillite material have been made in other sections of the Delaware Valley. Skinner in his admirable *Archæological Survey of New Jersey* sums up the situation as follows.

¹ *The Antiquity of Man in the Delaware Valley and the Eastern United States*, Henry C. Mercer. Publications of the University of Pennsylvania, Vol. VI, 1897, pp. 81-82.

"PREDECESSORS OF THE DELAWARE INDIANS"

"The Lenni Lenape, although found here by the first white settlers, were not the oldest inhabitants of the region. Beneath the immediate surface, darkened by the refuse from Indian habitations, chipped implements of argillite have been found in the undisturbed yellow soil under conditions that suggest considerable historical antiquity. No pottery or implements other than large rough argillite points, blades and the like occur, whereas the Lenape layer above is rife with pottery, implements of all kinds, and materials. In the valley of the Delaware this phenomenon has been amply observed and investigated by Dr. C. C. Abbot, Dr. Ernest Volk, and others. Mr. Lockwood is said to have noted it at Keyport, in the shell heaps, and Messrs. Edmund Shimp and R. W. Emerson, of Bridgeton, have recorded the presence of at least one site, on Cohansey Creek, where crude argillite tools alone occur. Mr. Schrabisch, in his work on New Jersey rock shelters, Mr. Gregor in Pennsylvania, and Mr. Harrington in New York, report the presence of a non-pottery using people as shown by the bottom, hence the oldest, layers in the débris of the caves."¹ This would indicate that the area occupied by the argillite users has yet to be definitely outlined, although the center appears to have been the lower Delaware Valley.

Mr. Skinner concludes: "Possibly there was an argillite culture here before the Delaware or Lenape Indian that our ancestors knew, but to say that these people were of different race, a race that could be called pre-Indian, is too much, although they may be called pre-Delaware with some certainty." Our conclusions agree with the latter part of Mr. Skinner's statement, that the argillite culture represents a people which may be called pre-Delaware, although it may not be pre-Indian. The authenticity of the argillite culture itself we believe is proven beyond a doubt.

¹Archæological Survey of the State of New Jersey. Alanson Skinner and Max Schrabisch. Geological Survey of New Jersey. Trenton, 1913.

The excavations of the present site in which numerous types of implements from both the ancient argillite and modern Lenape cultures are found in undisturbed soil in successive geologic strata, with a possible intermediate culture between, gives a firm footing for the consideration of the problem. It determines the position and enlarges the extent and form of the older culture, but raises the broader question as to whether the argillite culture extended with modifications through the intermediate into the modern. A further and intensive investigation over the area covered by reported argillite finds will be necessary to settle this aspect of the question.

DESCRIPTION OF THE SITE

The site excavated is situated in southern New Jersey, on one of the branches of Rancocas Creek, about six miles from the Delaware River. It is on a farm belonging to Edward Crispin, situated midway between Masonville and Medford, and some two and a half miles from the former. The stream on which the site is located offers evidence of having once been much larger than at present, as is shown by an adjoining swampy area which is flooded in wet seasons. In early times this locality must have been easy of access from the Delaware by canoe. The elevation above sea level is slight. Excavations showed conclusively that the site had never been cleared, which gives the material unique value as archeological evidence. The modern Lenape material was found undisturbed beneath the leaf mold of the present hardwood forest, while occasional cedar stumps in the yellow soil showed the nature of the former forestation. Some two feet beneath the leaf mold a few scattered finds, representing a possible intermediate culture were located; and from five to seven feet beneath the surface, caches of argillite implements, bannerstones, etc., were found lying on white glacial sand at its juncture with the overlying yellowish sand. (See Fig. 1.)

The caches were found arranged in three roughly parallel

rows around a large central fire pit. (See Fig. 2.) They were separated from each other by a distance of about six feet, with a distance of from ten to twelve feet between the rows. There did not seem to be any special outline indicated by the caches other than a parallel order. The caches may be divided into two groups. First, those containing bannerstones and ceremonial objects, which were by far the most numerous, and secondly, those containing two large points associated with fragments of bone. We have designated these as banner-

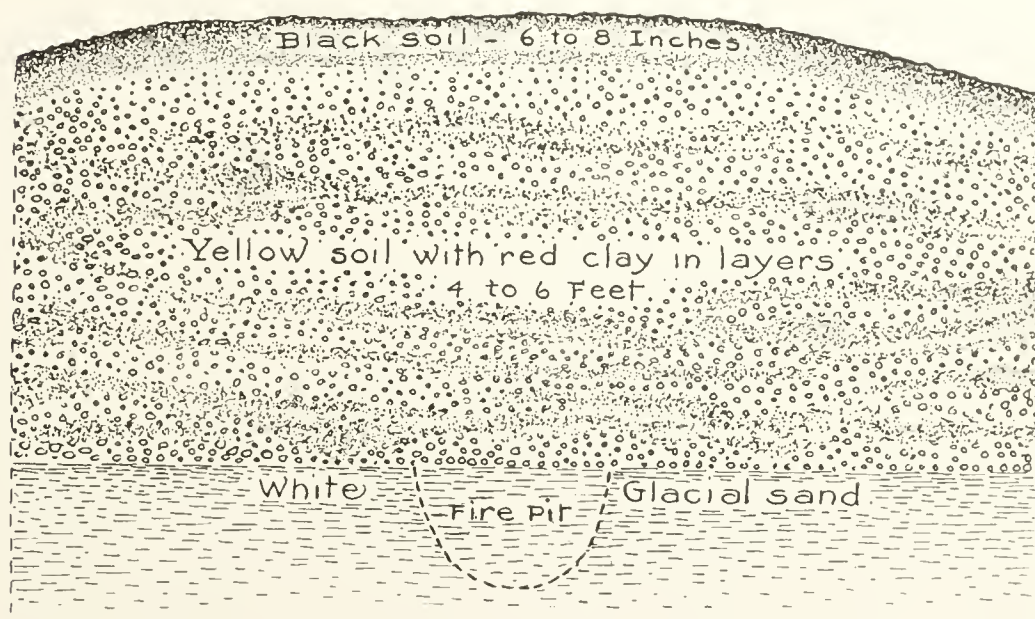


Fig. 1. Cross Section of Excavation.

stone and two-point caches. There was a considerable variety in the value of the objects in the different caches, one cache containing no less than three bannerstones, all of them large and of fine quality. The usual form of cache, however, consisted of a single banner stone and a few ceremonial objects. One cache situated rather apart from the others, contained only one large and very fine bannerstone which was stained by decayed animal matter, probably a wrapping. The difference in value of the caches may represent a corresponding difference in the wealth and station of those who made the

offerings, but as there were no other indications of rank, it is impossible to decide this question. It has also been suggested that the caches were not properly offerings, but marked the position of dignitaries around the council fire. As a rule, the caches adjacent to the fire pit were the richest.

The great central fire pit had discolored the glacial sand to a depth of three feet. No remains were found in the fire

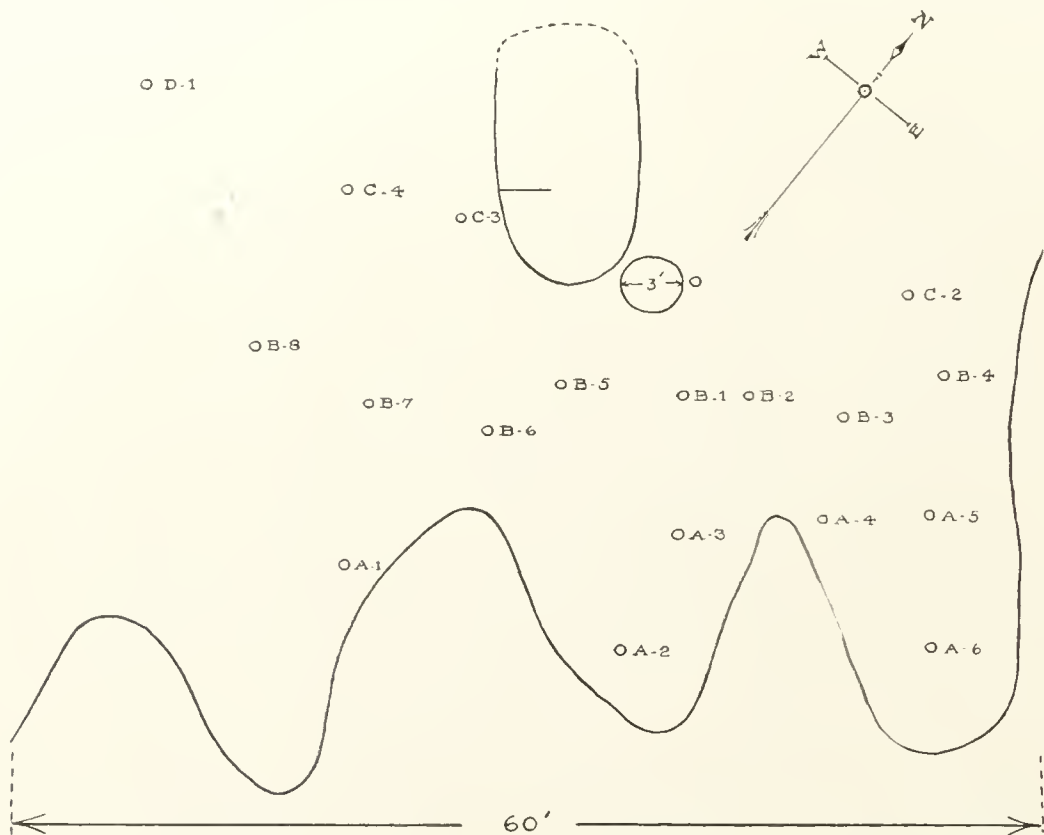


Fig. 2. Diagram Showing Arrangement of Deposits about Fire Pit in the White Sand Stratum.

pit itself, although the third line of caches ran close to the edge. There was a small circular fire pit three feet in diameter due east of the large one with a cache adjacent. (See Fig. 2.) To the west of the rows of caches and the central fire pit, several small fire pits were found, associated with scattered implements which may have marked the temporary camping place of those who took part in the ceremonies. An interesting point in

connection with all the fire pits was that while the white sand was discolored for some distance down, the yellow layer above was unmarked, proving conclusively that they had no connection with the upper layer.

ARGILLITE WEAPONS AND IMPLEMENTS

All the weapons and implements found in the lowest level were, with one exception, of argillite. The exception was a very large and beautiful point of bluish quartzite, which was found in a cache of ceremonial objects. Mr. Skinner, in the *Archæological Survey of New Jersey*,¹ calls attention to the fact that, while the Lenape used argillite, such points are always found commingled with others of jasper, flint and quartz, not isolated, and generally in a different cultural horizon. One argillite point was found in the top stratum of the site, associated with points of the above materials. It was, however, finely worked, modern in shape, and unweathered. The points from the leaf mold show none of the signs of decay and great age characterizing those from the lowest level. The intermediate points show slight signs of decay.

As far as this site is concerned, the sequence seems to be as follows. First, an early period characterized by crude workmanship and an exclusive use of argillite; second, an intermediate period, characterized also by the use of argillite, but with improved workmanship and the beginnings of pottery, and third, the modern period, in which the material corresponds to the ordinary surface finds of New Jersey. The intermediate material resembles the earlier culture rather than the modern.

Whether the argillite culture represents a race of migration which was pre-Lenape in other places, it certainly preceded the modern culture in this locality. The length of time required for the deposition of the strata, separating the cultures, cannot be determined exactly but it represents a considerable period of time. If the deposit is æolian, the time might be

¹ *Archæological Survey of New Jersey*, Skinner and Schrabisch, p. 19.

comparatively short, but if the strata were laid down under water, the time would be immensely extended.

Among the argillite points found in the lowest level, six types were clearly distinguishable. In every case the entire surface had decayed until it could be easily scratched with the finger nail. The decay in some cases had gone so far as to obscure all marks of the workmanship. Although the ancient workman seemed to have a good sense of form, the technique is poor, the implement having been formed by knocking off a few large flakes. The argillite implement shows no sign of the secondary chipping and finishing characteristic of the modern work. The ordinary type is diamond-shaped, without well-defined barb or stem, and is characterized by a very heavy midriff. The lances are leaf-shaped. The knives have a barb on only one side, but the stem is developed. One type only has the broad face and well-developed barb and stem of the modern type. All of the specimens are much larger than corresponding modern forms.

1. Lances. The lances are fairly thin, ovoid in form, roughly chipped, but well-shaped as to outline. They resemble in form the Eskimo lance, and must have been used for large game. They do not, however, equal in size the large ceremonial point. In every case they were found in pairs, associated with crumbling fragments of bone. They were enclosed in a matrix of decayed animal matter, which, when split open, revealed the points lying on either side of the bone. The matrix may represent a skin wrapping, which enclosed the complete offering of a small animal and the implements. The bones were so badly broken and decayed as to render the species indistinguishable. These two-point caches were found interspersed among others containing bannerstones, fetiches, etc. In one case a single large ceremonial point appeared to take the place of the customary two. A single large bannerstone answered the same purpose in one of the bannerstone caches. All the caches were separated by an interval of at least five feet. The dimensions of two typical lances are as follows. (See Plate XVI, A, B.)

Ref.	Length cm.	Width cm.	Thickness cm.
A.....	11.5	6.7	1.2
B.....	10.9	6.5	1.3

Hand daggers(?).—Four large crude points, which from their shape could not have been hafted, were found scattered between the caches. As far as workmanship goes they are the poorest of the series. One face is formed by a single large flake, while the other has been formed by three or four heavy strokes.¹ Apparently these represent lost implements of no particular ceremonial import. The dimensions of three specimens are as follows. (See Plate XVI, C, D, E.)

Ref.	Maximum Length cm.	Maximum Width cm.	Maximum Thickness cm.
C.....	12.5	4.4	2.1
D.....	12.4	3.4	1.3
E.....	10.5	3.9	1.4

It will be seen from the above measurements that these specimens are a crude, long, thick point, in direct contrast to the broad, oval, carefully outlined lance.

Knives.—At the lowest level, but some distance to the left of the bannerstone caches, several rude knives were found. These specimens were more carefully worked than the hand daggers, with a distinct stem for hafting. They have only one barb, and the blade has a distinct curve, along the lower side of which the edge is better worked, which suggests that only one edge was used for cutting. The points were well sharpened. (See Plate XVI, F, G, H.) Dimensions:

Ref.	Maximum Length cm.	Maximum Width cm.	Maximum Thickness cm.
F.....	12.4	3.8	1.3
G.....	10.7	3.4	1.2
H.....	9.5	3.6	1.

¹ They have no resemblance, however, to the "Turtlebacks," either glacial or modern.

Diamond-shaped points.—As mentioned above, the characteristic point was diamond-shaped, without clearly marked barb or stem. These specimens varied largely in size, from minute points to some as large as lances. They also exhibited a considerable variety of workmanship. Typical measurements are as follows. (See Plate XVII, A, B, C, D, E.)

Ref.	Maximum Length cm.	Maximum Width cm.	Maximum Thickness cm.
A.....	10	3.1	.9
B.....	8	3.2	.7
C.....	7.7	2.8	.85

(D and E are smaller specimens, showing range in size.)

In common with the broad, barbed points, they are much thinner than the foregoing, but still very thick in comparison with the modern points.

Broad-faced, barbed points.—These specimens are in direct contrast with the general diamond-shaped type in being roughly triangular, with broad faces, well-developed barbs, and stout stems for hafting. They were probably bound on the shaft with a "figure eight" lashing, whereas the diamond-shaped point must have been inserted in the split end of the shaft. Characteristic specimens (see Plate XVII, F, G, H) give the following measurements.

Ref.	Maximum Length cm.	Maximum Width cm.	Maximum Thickness cm.
F.....	7.4	5	.9
G.....	8.3	4.4	.85
H.....	7.9	3.6	.9

It will be seen from the above measurements that these points are more uniform in size than the diamond-shaped specimens. The thickness is about the same.

Fish spears(?).—This type (see Plate XVII, I, J, K, L) has already been named by Abbot. It is thick, heavy, narrow,

barbless or slightly barbed point with a rounded stem. From its shape it may have been inserted in a hollow reed. In one case a point of this type was found in a cache associated with fossil brachypods painted red.

Ref.	Maximum Length cm.	Maximum Width cm.	Maximum Thickness cm.
I.....	7.9	2.5	1.9
J.....	8.2	1.9	1.2
K.....	7	2	1.2
L.....	12	3.7	1.3

BANNERSTONES

The site excavated was remarkable for the large number of bannerstones found. The presence of these objects raises an interesting question, for in size, beauty, and finish of workmanship they far surpass those found on the recent village sites of this region, and are absolutely at variance with the crude character of the implements with which they were associated. At first the authors were inclined to believe that they must have been imported from some adjoining area of higher culture, but a study of specimens from other regions where these peculiar objects occur showed that they did not agree in either form or material. It is a well-known fact that many tribes in a low grade of development have acquired a disproportionate skill in some one direction, usually artistic or technical. As an example we might cite the savage tribes of the Amazon, who have acquired great skill in the making of crystal tubes, while their ordinary artifacts are of the crudest type. The manufacture of bannerstones is not necessarily connected with skill in chipping. The specimens excavated show that they have been formed by pecking and polishing. They required skill in boring and a good sense of proportion. These qualities are often exhibited by peoples whose chipped artifacts are inferior.

In this particular group the methods of manufacture

seem to have been uniform. The mean diameter of the bore was 1.4 cm. Outside of a single specimen with an unusually large bore, the variation in nineteen specimens was not over .2 cm. The variation in diameter at the two ends was not over .3 cm. which is the more remarkable as a number of the specimens have been bored from both ends. The maximum length of the centrum, that part of the bannerstone surrounding the boring, was 7.7 cm., and the minimum 4.2. The average length was approximately 6 cm. The width of the centrum was remarkably uniform throughout the series, 2.3 cm. in four specimens, 2.2 cm. in five other specimens and 2.4 cm. in three, all of varying size. The thickness of the wings was also remarkably uniform; 1.2 cm. in five specimens, 1.3 cm. in four others, 1.1 cm. in two, and 1 cm. in two. The wings of No. 5 were only .9 cm. in thickness. In outline and spread of wings the bannerstones varied considerably, from an extremely large specimen with a spread of 15 cm. to one of three small specimens averaging 7 cm. As to outline, they may be divided into two main groups, the pick-shaped and the square ended (see plates) but the individual variation is so great that a separate description has been given for each one.

Plate XXI, 5. The largest of the series. Straight ended type. Rubbed smooth, but not polished. The centrum is evenly rounded and does not project beyond the base of the wings. The wings have been ground to an edge from both sides at the ends, and are not perfectly aligned with each other. It has been drilled from both ends, the bore meeting about one-third of the distance from the top. One side shows stains which may be due to a hide wrapping.

Plate XXII, 4. Large stone of pick form, smoothly rubbed but not polished. The material has been worked in such a way that on one side a patch of different colored strata appear at the tip of either wing and on the centrum. The centrum has three well-marked facets on either side, and there are grooves at the base of the wings on both sides. The centrum protrudes very slightly below the wings. The edges of the wings are

ground square, and the wings themselves are poorly aligned. A large chipping on the edge of one wing has been partly ground out. It has been drilled from both ends, the bores meeting about one-third of the distance from the top. The juncture is very exact.

Plate XXIII, 3. Large stone of intermediate form, rubbed, and the centrum but not the wings polished. One side of one wing shows a few marks of pecking which have not been entirely rubbed out. The centrum has three well-defined facets and a groove at the base of the wing on only one side. On the other it is smoothly rounded. At the bottom of the centrum, chips have been broken off on both sides and the edges ground back at an angle to destroy the roughness. The side of both wings have been ground from both sides to work out blemishes, but were originally as Plate XXI, 2. The wings are almost perfectly aligned. This stone has been drilled from one end only.

Plate XXI, 4. Fairly large stone of pick form, rubbed and polished. The centrum is rounded, and there are grooves at the bases of the wings, although one of the four is lacking. At the bottom of the centrum a large chip has been broken off on one side, and the stone ground back from the edge of the bore at an angle all round so as to leave a thin knife edge. The upper edge of the centrum has also been slightly broken and ground back. Large chips on the tips of both wings have been partly ground out. The wings are well aligned, but are not at right angles to the axis of the centrum. The boring has been done from one end.

Plate XXI, 3. A very perfect and beautiful stone of the square ended type, rubbed and polished. The centrum is ground flat on either side, but from this face it curves off smoothly into the wings. The lower end of the centrum has been slightly ground back from the bore, but there are no signs of breakage. The wings of this specimen are very thin, and brought to a square edge all round. Chipping on the edge and tip of one wing has been partly ground out. It has apparently been drilled from one end, but the markings at either

end show that the diameter of the bore has been enlarged after the drilling was finished. In the center the marks of the original boring are still present.

Plate XXI, 2. This is a smaller and cruder replica of No. 5, but is unpolished. The centrum has a facet on either side, and on one side there are slight grooves at the base of the wings. The wings are thick and heavy at the base and taper rapidly. They are poorly aligned, and a chipping at the end of one has been ground out. The bore is not in the middle of the centrum. The drilling has been done from one end, and the bore has been enlarged at the top, where the usual circular markings are obliterated by horizontal scratches. This specimen has stains on both sides similar to those of No. 1.

Plate XXI, 1. A large stone of unclassifiable form. The outline is oval, it being scarcely possible to distinguish top from bottom. It is rubbed and partly polished. The centrum is slightly flattened on both sides, but runs off smoothly into the wings. It projects slightly at both ends. The wings are well aligned, and have been ground to a sharp end all round. The boring seems to have been done from one end, but no marks are visible. The opening is oval at both ends, and is not in the middle of the centrum, so that one edge is considerably thinner than the other.

Plate XXIII, 2. A large stone of pick form, ground and polished. When found it lay in three pieces, having been split down the bore. The centrum has three well-defined facets on either side, the top and bottom ones being much the largest. At the bottom of the centrum a large flake has been broken out for its entire width on one side. The centrum has been ground back on this side for almost a third of its entire length, and on one wing and along the bottom of the break is a deep cut left by some sharp edge, probably an argillite flake, showing that the maker had begun to cut away that end of the stone, but thought better of it and contented himself with grinding it down. Chippings have been ground out of the ends of both wings. The sides of the wings are

square edged, the ends sharpened. The wings are well aligned. The bore shows longitudinal markings, faint in the middle and growing into grooves at either end. At its openings the bore is oval.

Plate XXIII, 4. A large stone intermediate in form between the pick and square ended types, ground and polished. The centrum shows marks of pecking at either end which have not been entirely ground out. The centrum has well-defined facets on either side, the edges being sharp and true. The wings are poorly aligned, and ground to a sharp edge at the bottom and ends. It has been drilled from one end, but there are longitudinal markings the entire length of the bore.

Plate XXIII, 5. A very large stone of intermediate form, ground and polished. This stone is interesting in that it has been broken and mended by the owner. Holes have been drilled in both wings through which thongs were passed and the parts tied together. There are three of these holes in one wing, and in the other, the end of which is missing, two complete holes and the edges of two more. All the holes have evidently been made with a stone drill. All three in the one wing are drilled through from the one side, and one in the other wing has been made in the same way. The others have been drilled from both sides. The hole in the upper edge of the complete wing has no connection with the mending and may have been made for the attachment of some ornament. The centrum has a single not very well-defined facet on either side. The wings are perfectly aligned and square edged all round. The implement was evidently broken by a blow on the tip of one wing. The boring has been done from both ends, and the bore shows circular lines.

Plate XXII, 5. Large stone of pick form, ground and polished. The centrum has a well-marked groove down the middle on both sides. The wings have a sharp upward curve, and both wings are decorated on one side with incised lines running at right angles to the centrum. There are a few marks of pecking, imperfectly ground out. The wing tips have been

ground to an edge from both sides. The stone has been drilled from one end, and shows circular markings.

Plate XXIII, 1. Large and perfect stone of pick form, ground and polished. The centrum has a single well-defined facet on either side, but the facets are not exactly opposite each other. Chips have been broken from the bottom of the centrum at both sides and the roughness ground out. One wing is square edged all round, the other ground to a sharp edge, in an effort to remove the marks of two deep chippings. The stone has been drilled from both ends, but the bore is oval and shows both longitudinal and circular scratchings.

Plate XXII, 3. A very large stone of pick form, ground and highly polished. This is the most beautiful specimen in the collection. The centrum has a small but well-marked facet on either side, from which it runs off smoothly into the wings. At the bottom it projects beyond the wings considerably, but is flush at the top. The wings are square edged, but the tip of one has been chipped and the resulting roughness ground out. The stone has been drilled from one end, and the bore is almost a true circle, although it shows longitudinal markings.

Plate XXII, 2. A fairly large stone of pick form, ground and partly polished, but still showing many striations. The centrum has a large flat facet on one side, and a deep line incised on the surface between the facet and wing, and another at the base of the wing. The corresponding surface on this side is unmarked. On the other side the centrum has three facets. The top one has been deeply incised along either edge and worked out until it is below the level of the sides. The other two facets are also well marked, but one is more sharply cut than the other. The surface of the centrum and wings has been ground back for a little distance at the bottom. One wing is square edged, the other rounded in an attempt to grind out a large blemish. The stone has been drilled from both ends, two-thirds from the bottom and one-third from the top. There are deep grooves running the entire length

of the bore, except far in the middle on one side, which shows faint circular markings.

Plate XXIV, 6. A medium sized stone of intermediate form. It has been ground, but still shows many marks of pecking. The centrum has a well-marked facet on either side. The wing tips are recurved and pointed, and the wings are decorated with lines on one side, as in No. 5. The wings are square edged and very thick and heavy for their length. A small chip near the tip of one has been partially ground out. The bore is very large and marked longitudinally, except in the middle, where there is a small patch of the original boring.

Plate XXIV, 5. A medium sized stone, ground and polished, one wing of which approaches the pick, the other the square ended form. The centrum has a concave upper facet on one side, and a very slightly concave, almost flat one on the other. The latter is marked by a deep scratch made with a sharp edge. The wings have a marked upward curve and are very heavy for their length. They are sharpened at the tips. The stone has been drilled from both ends, the bores meeting one-third from the top, and shows circular marking.

Plate XXIV, 4. Medium sized stone of pick form, ground and partly polished. The centrum is smoothly rounded. The wings are well aligned, but uneven in shape, with edges rounded.

Plate XXIV, 3. Small bannerstone of square ended type, ground and polished. There is a groove down the centrum on either side. The wings are square edged all round, and one has been partly broken off and the stub ground into shape. The wings are heavy for its size. The bottom of the centrum has been chipped in several places.

Plate XXIV, 2. Small stone of pick form, ground and polished. Part of the centrum and one wing are missing, a large chip having been split off from the top. The wings are square edged and heavy. The bore shows circular markings, and differs from all the others in that it tapers sharply from the top to the bottom. The perforation was probably made

with a long stone drill, instead of the reed used in the other specimens.

Plate XXIV, 1. Small stone of triangular shape, ground but not polished. The centrum has a small facet on either side, and the edges of the bore are chipped at the bottom. The bore is not in the middle of the centrum. The wings are very thick and square edged. It has been bored from one end and shows circular markings.

Plate XXII, 1. Large stone of peculiar form, ground and polished. The centrum extends beyond the wings at the bottom, and one side is rounded, the other has a well-marked facet. The wings are very broad and short, so that the effect is that of a mace head rather than a bannerstone. The wings are thick and ground to an edge all round. It has been bored from both ends, and the bore shows circular markings.

With the exception of the three small and the mace-shaped bannerstones, the group is fairly homogeneous, and hence offers an unusual opportunity for study. A careful comparison has been made for the purpose of determining: (1) what were the methods of manufacture, and (2) what uses could they have been put to? In the first case the evidence is clear, and verifies the observations of other investigators, that the bannerstones were first roughly chipped into shape, then pecked and ground, and finally polished. In one object, intermediate in form between the bannerstones and the crescent-shaped stones the pecking had been dispensed with, and the shaping done by rubbing with some instrument which left broad shallow striations. Similar striations are present in a few of the bannerstones, but the finishing seems to have been done with a piece of fine-grained sandstone, or with sand and water. All the stones, with the possible exception of No. 19, were drilled with a reed and sand. The boring was begun at the bottom and carried through, or carried about two-thirds of the way, and then finished from the other end. The exactness with which the two borings meet shows a high degree of skill. In several cases the diameter of the bore has been enlarged at one or both

ends by rubbing with a sharp point, or with a thong and sand. We know from unfinished specimens found on other sites that the boring was not begun until the shaping was finished.

In regard to the use of the bannerstones, at this site at least, the evidence seems conclusive that they were hafted. In seven specimens the edge of the bore had been broken out. In five the break is at the bottom, and in one at both top and bottom. In the only specimen where the break is at the top alone, it marks the larger end of the bore, which tapers rapidly from top to bottom. This breakage is such as would result from driving into the bore a shaft somewhat too large for it. A similar condition is found in some of the beautiful quartz specimens from the Mississippi Valley, in which the centrum has been broken out on one side for the whole or part of its length, while the other side and the wings remain uninjured.

The soft material from which the bannerstones were made, and the perfect condition in which many of this series were found, suggests that they were never subjected to the rough usage of ordinary implements. It has long been taken for granted that they had some religious significance, but the particular use to which they were put remains an enigma. It seems most probable that they were mounted on the end of a staff and used as religious insignia. They may also represent the double-bladed axe, as a ceremonial weapon.

MEASUREMENT OF BANNERSTONES

(All measurements of banner stones are in centimeters)

Ref.	<i>Bore</i>		<i>Centrum</i>		<i>Wings</i>	
	Diameter of Top	Diameter of Bottom	Maximum Length	Maximum Width	Thickness	Spread
Pl. XXI —5.	1.5	1.45	6.5	2.6	1	15
Pl. XXII —4.	1.45	1.35	6.3	2.4	1.3	14.75
Pl. XXIII—3.	1.4	1.3	6.85	2.2	.75	13.7
Pl. XXI —4.	1.55	1.4	6.4	2.2	1.2	12.1
Pl. XXI —3.	1.45	1.45	7.5	2.4	.9	12.4

MEASUREMENT OF BANNERSTONES—(*Continued*)

Ref.	<i>Bore</i>		<i>Centrum</i>		<i>Wings</i>	
	Diameter of Top	Diameter of Bottom	Maximum Length	Minimum Width	Thickness	Spread
Pl. XXI —2.	1.45	1.3	6	2.5	1.8	9.95
Pl. XXI —1.	1.4	1.4	5.8	2.2	1.2	12.2
Pl. XXIII—2.		Broken				
Pl. XXIII—4.	1.4	1.4	6.25(?)	2.2	1.1	12.4
Pl. XXIII—5.		Broken				
Pl. XXII —5.	1.55	1.55	5.3	2.3	1.2	12.4
Pl. XXIII—1.	1.55	1.55	5.15	2.2	1.2	14.5
Pl. XXII —3.	1.55	1.4	7.7	2.3	1(?)	13.35
Pl. XXII —2.	1.7	1.65	5.2	2.3	1(?)	11.6
Pl. XXIV—6.	1.9	1.9	5.4	2.85	1.3	9.9
Pl. XXIV—5.	1.6	1.23	5(?)	2.6	1.5	11
Pl. XXIV—4.	1.5	1.5	4.5	2.3	1.2	11.3
Pl. XXIV—3.	1.3	1.3	4.2	2.1	1	7.4 (?)
Pl. XXIV—2.	1.4	1.15	4.3 (?)	1.7	1.1	6.6 (?)
Pl. XXIV—1.	1.25	1.2	4.45	2.1	1.3 (?)	7
(Mace?)						
Pl. XXII —1.	1.4	1.4	7.8	2.4	1.3 (?)	7.6

CEREMONIAL OBJECTS OTHER THAN BANNERSTONES

Ceremonial points.—In this class (see Plate XVI, I, J, and K) we have included three isolated points which are so far superior in size and workmanship to anything of like sort in the lower level, that they belong in a class by themselves. These points were found directly associated with bannerstones or other ceremonial material. Two were of argillite and the third of quartzite, the only specimen of that material in the entire site. At first we were inclined to believe that both they and the bannerstones were importations from some other area of higher culture, but a careful survey of adjoining regions showed that they were unique, and probably a local product. These points, like the bannerstones, represent the high water mark of local workmanship which was spent on offerings, while the everyday tools were roughly made; or they may have been insignia of rank, as has been suggested for the banner-

stones. The ceremonial points are characterized by large size, extremely thin blade with carefully chipped edge, perfect barbs and stem, and beautiful proportion. For quality of workmanship considering the poor material, they would rank favorably with specimens from any of the areas with a recognized high culture. The dimensions of the three specimens are as follows:

Ref.	Maximum Length cm.	Maximum Breadth cm.	Maximum Thickness cm.	Material
I.....	14	6	1.4	quartzite
J.....	13	5	.7	} argillite
K.....	10.6	4	.8	

Ceremonial axes.—These specimens, which were found in the caches of sacred objects, represent an entirely new type for New Jersey. (See Plate XVI, L, M, N, O.) They are of argillite, chipped and unpolished, with a ground blade. In one specimen, probably unfinished, the edge is chipped only (O). The general features of all four are: thick cross-sections, rounded upper end, and a well-beveled blade. None are grooved. In size they resemble the Eskimo adze, but the thickness of the midsection would prevent a similar hafting, except in the case of the smallest, unground specimen, which is triangular in cross-section. The other three were probably bedded in the handle. The largest specimen is oblong in shape, and slightly curved. On the outer side of the curve a tang has been left for lashing, or to prevent the implement from slipping through the handle. There is no sign of a groove but the sides of the implement just above the tang have been somewhat smoothed. The edge is sharpened evenly from both sides. The second is much smaller, but agrees with the first in shape and proportions except that it lacks the tang and is straight. It also is evenly ground from both edges, but the surface is unpolished, and it shows no signs of use. The third is of a roughly triangular form, the cutting edge forming the lower side. As the sides narrow, it thickens until the upper end is almost cylindrical

in cross-section. The implement bears a striking resemblance to some which have been discovered in the Swiss lakes which were hafted in deer horn. The dimensions are as follows:

Ref.	Maximum Length cm.	Maximum Width cm.	Maximum Thickness cm.	Breadth of Blade cm.
L.....	12.1	5.7	2	4.8
M.....	7.8	3.9	1.7	3.4
N.....	9	3.9	2	2.7
O.....	8.7	4	1.5	3.3

Blunt pear-shaped axe.—This implement, like the chipped axe, is another new type for New Jersey. (See Plate XVIII, A.) The specimens vary in size, but are characterized by the same general outline, which is roughly pear-shaped, with one side concave. The curved side suggests that the axe was held in the hand. There are no signs of hafting. In cross-section the axes are roughly oblong, thickening toward the blunt edge. They show no signs of working except at the lower edge, which battered into shape. They were found associated with fragments of bone, and may have had some sacrificial use. (B, C, and D show other specimens of the same type.)

Ancient chipped axe or hoe.—In the lowest stratum, but outside the circle of the ceremonial caches, was found one large specimen of an ancient chipped axe or hoe. (See Plate XIX, C.) The specimen was roughly oval in form, with the sides parallel, rounding off at either end. The entire surface shows chipping, and the cutting edge is chipped and not ground. The surface was badly decayed. There were signs of hafting. The dimensions of the axe, which much exceed those of the other types mentioned, are as follows.

Maximum Length cm.	Maximum Breadth cm.	Maximum Thickness cm.	Breadth of Blade cm.
13.3	8.5	2	7.4

Tanged adze.—One specimen of a square, flat adze, with tangs on the sides, was found in one of the caches. These

implements are flat on one side, curved on the other, with a ground and beveled edge, and were probably hafted at an angle. The spuds at the sides probably held the lashing. The peculiar form of this implement suggests that it may be a local variety. Even the ordinary type of adze is rare in New Jersey. Further investigation may reveal the limits of this variety. (See Plate XVIII, E.)

Hoes(?).—Under this head we have classified half a dozen broad crude argillite implements hollowed on one side. (See Plate XIX, A, B.) One specimen is almost square, with a thin edge (A). These were also found outside the ceremonial circle, but near a small fire pit at one end. All these specimens are roughly made, with no chipping on the edge or sides. A thin stone that suited their purpose seems to have been roughly blocked into shape. The rough but fragile edge suggests that they may have been used for digging in the sand.

Celts.—One large celt, roughly cylindrical in shape and battered at the edge, was found in one of the caches. (See Plate XIX, D.) E is a celt from the intermediate layer, which has a slightly concave face. No grooved implements were found in the entire collection from the lower area, although two grooved, square-faced axes were found in the top stratum. (See Plate XVIII, F, G.) H shows another modern axe which seems to have been double bitted.

Small hammers.—Two small hammers, cylindrical in shape, and about three inches long, were found in the ceremonial caches. They were simply pebbles of suitable shape, and showed no signs of working except the battered ends. (See Plate XIX, F and G.)

Ear plugs(?).—Three other small cylindrical specimens, with carefully rubbed ends, were also found in the caches. (See Plate XIX, J, H, I.) They had been slightly pecked around the middle. They appear too small and of too soft material to have been implements, and on that account have been classified as ear plugs, for which purpose they are well suited. This opinion, however, may not be final.

Paint stones.—Two sets of unworked stones, probably used for grinding paint, were found in the caches. They are represented by a flat lower stone and a round upper one, showing signs of wear at the point of contact. (See Plate XIX, K, L.) In one set the stones were still in position.

Crescent-shaped stones.—A series of crescent-shaped stones more or less carefully rubbed and polished, were found in the ceremonial caches. One suggested in outline a bannerstone, but was too thin to be drilled, and showed no signs of an external groove. The other specimens were much thicker, but roughly followed the same form. They were of various materials, but showed a fine luster, like that of the Southwestern pottery polishing stones. They probably belong to that class of indeterminate stone objects found in the Indian medicine man's outfit.

Other problematical objects.—Beside the crescent-shaped stones, other objects of an evidently sacred nature were found associated with bannerstones. Among these were four fossil brachypods, showing traces of red paint. (Ear plugs also showed signs of red paint.) A beautiful quartz crystal ball, carefully pecked into shape and then polished, was found in one of the caches. Oddly shaped iron concretions, also showing signs of paint, were scattered throughout the caches. Several white quartz pebbles were also found associated with the bannerstones.

INTERMEDIATE POINTS AND POTTERY

The intermediate points, which were also of argillite (see Plate XX, D), exhibit all the types found in the lowest level except the lance and the broad-faced barbed point. In addition there was one new type, the drill, represented by one long, finely chipped specimen. No drills were found in the lowest level. The boring of the bannerstones was evidently done with a reed. In one specimen, which had been broken, the fractured wings had been bored for lashing together, with a short, sharp point. The intermediate points are easily

distinguishable from the early type by a distinct advance in manufacture and the absence of patina. A considerable time must have elapsed for this difference in workmanship and age. The number of specimens found at this level was so small, although representing a number of types, that additional excavations should be made in this area in order to determine whether this culture may be rightly called intermediate. Specimens of modern points of various material from the top stratum are illustrated in (A).

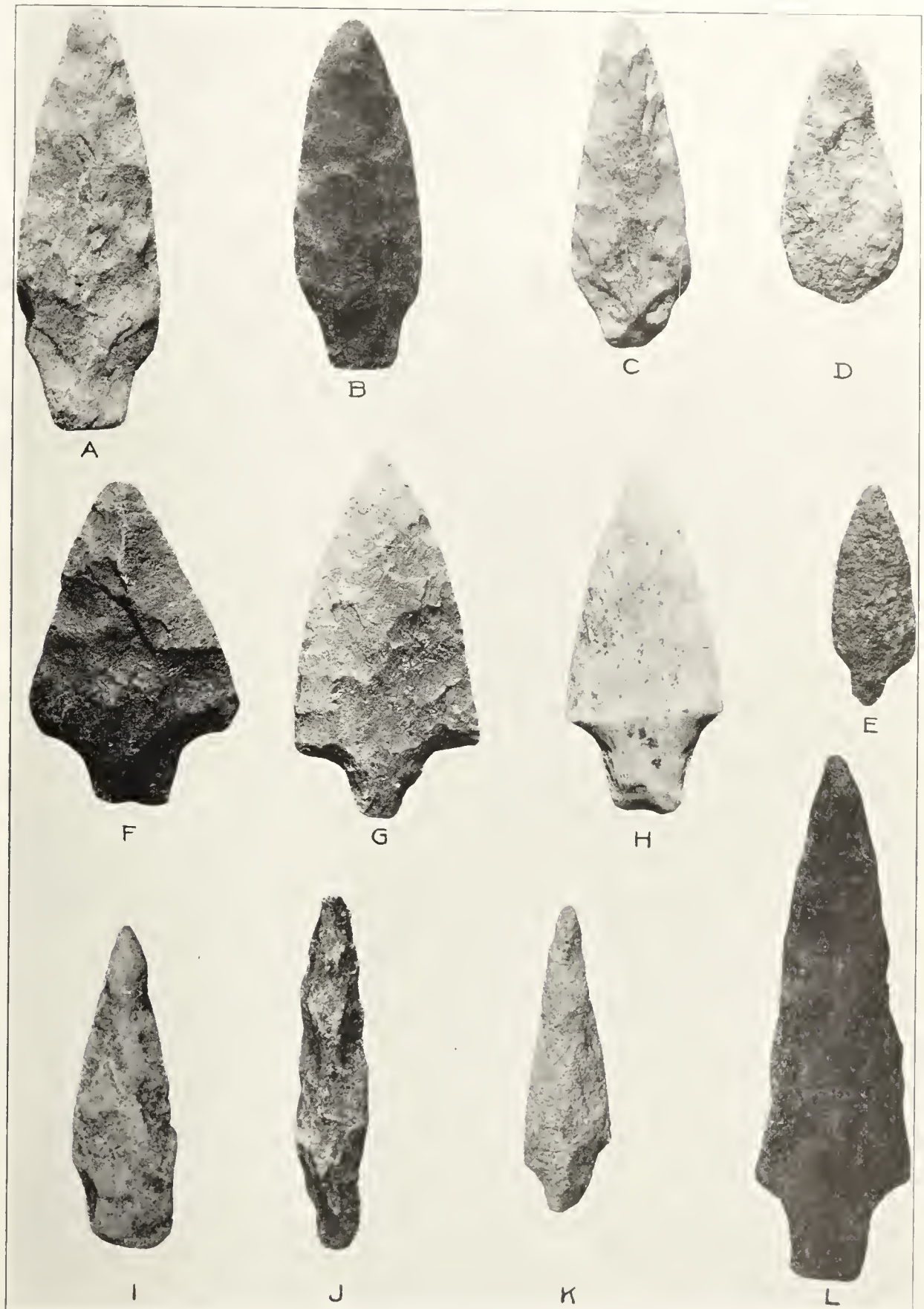
Clearer evidence than that furnished by the points is offered by small sherds of pottery found in the intermediate level. (See Plate XX, C.) No traces of pottery were found in the lowest level. The pottery of the intermediate culture was quite distinct from that of the modern Lenape, many bits of which were found on the surface. (See Plate XX, B.) The fragments from the intermediate level were composed of red clay and pounded steatite, the latter composing more than half the bulk. The red clay could have been obtained from small strips of the same running through the yellowish soil. Judging from its consistency it had been simply sun-dried and not baked. It could be easily scratched with the finger nail. Nevertheless the fragments showed a uniform thickness, and one piece showed the curve of a rim. It is possible that here we have the very beginning of pottery among these people and the steatite, which is not used to temper the recent pottery, marks the transition from the bowls of that material used for similar purposes.

KEY TO PLATES

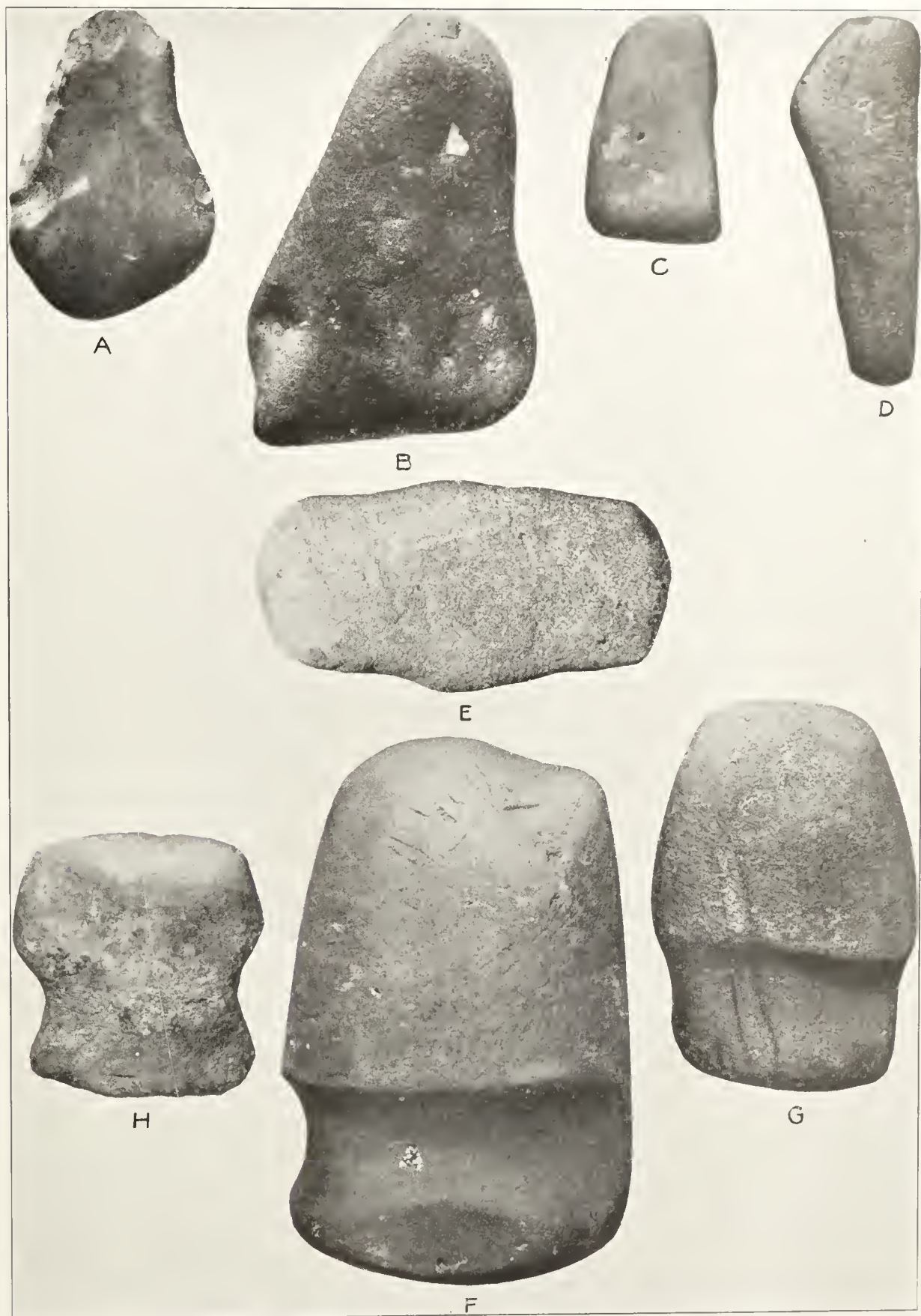
- Plate XVI. A to K. Argillite points from lowest level (except I, which is quartzite and from the lowest level).
 L to O. Argillite chipped axes from lowest level.
- Plate XVII. A to L. Argillite points from lowest level.
- Plate XVIII. A to D. Blunt axes (worked glacial pebbles) from lowest level.
 E. Tanged adz from upper level.
 F to H. Grooved axes from upper level.
- Plate XIX. A to C. Argillite hoes from lowest level.
 D to F. Celts from lowest level.
 J to I. Small hammers or ear plugs (?) from lowest level.
 K, L. Paint stones from lowest level.
- Plate XX. A. Points from upper level.
 B. Potsherds from upper level.
 C. Potsherds from intermediate level.
 D. Argillite points of various types from intermediate level.
- Plates XXI, XXII, XXIII and XXIV. Bannerstones from lowest level.



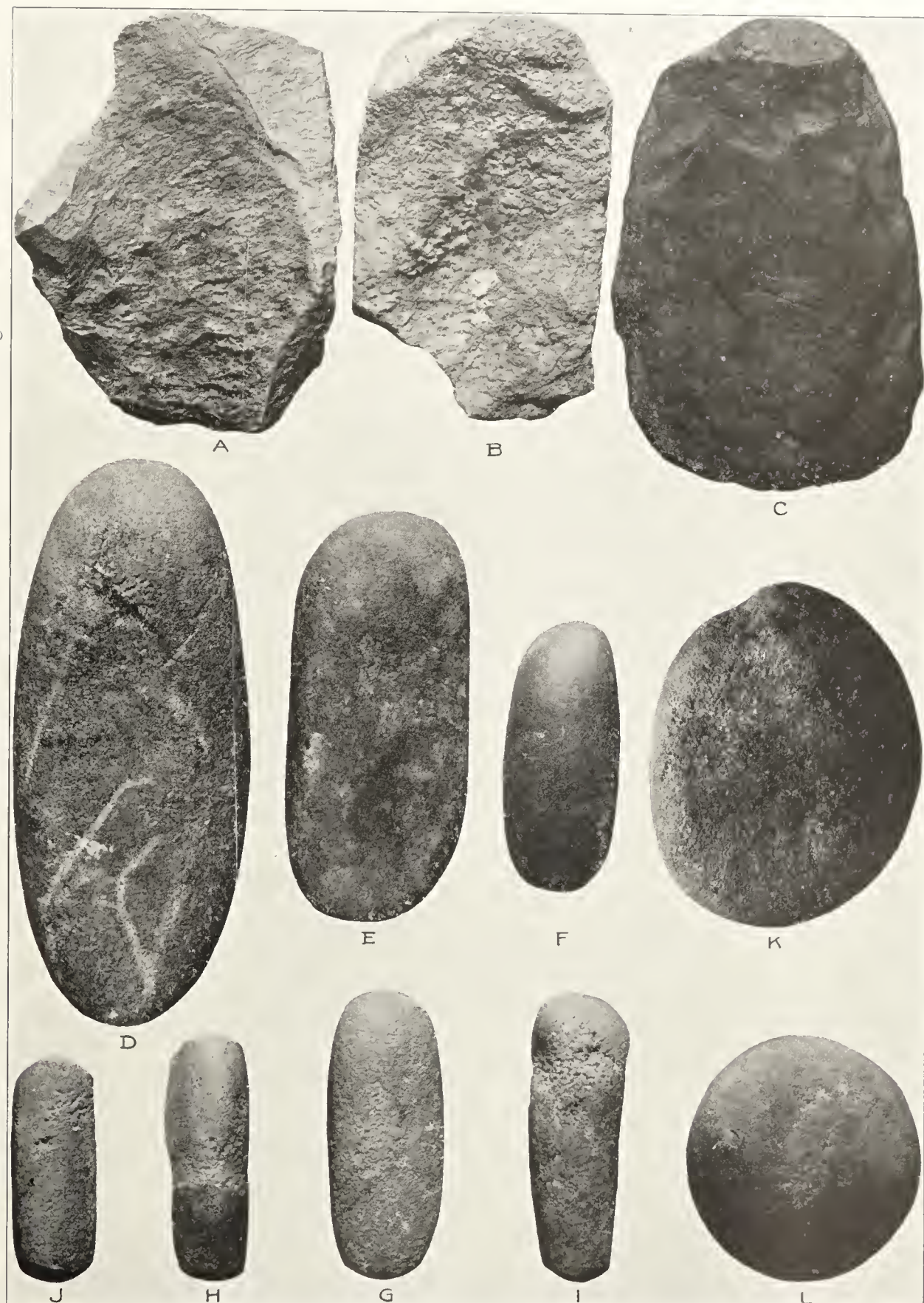
IMPLEMENTS FROM LOWEST LEVEL



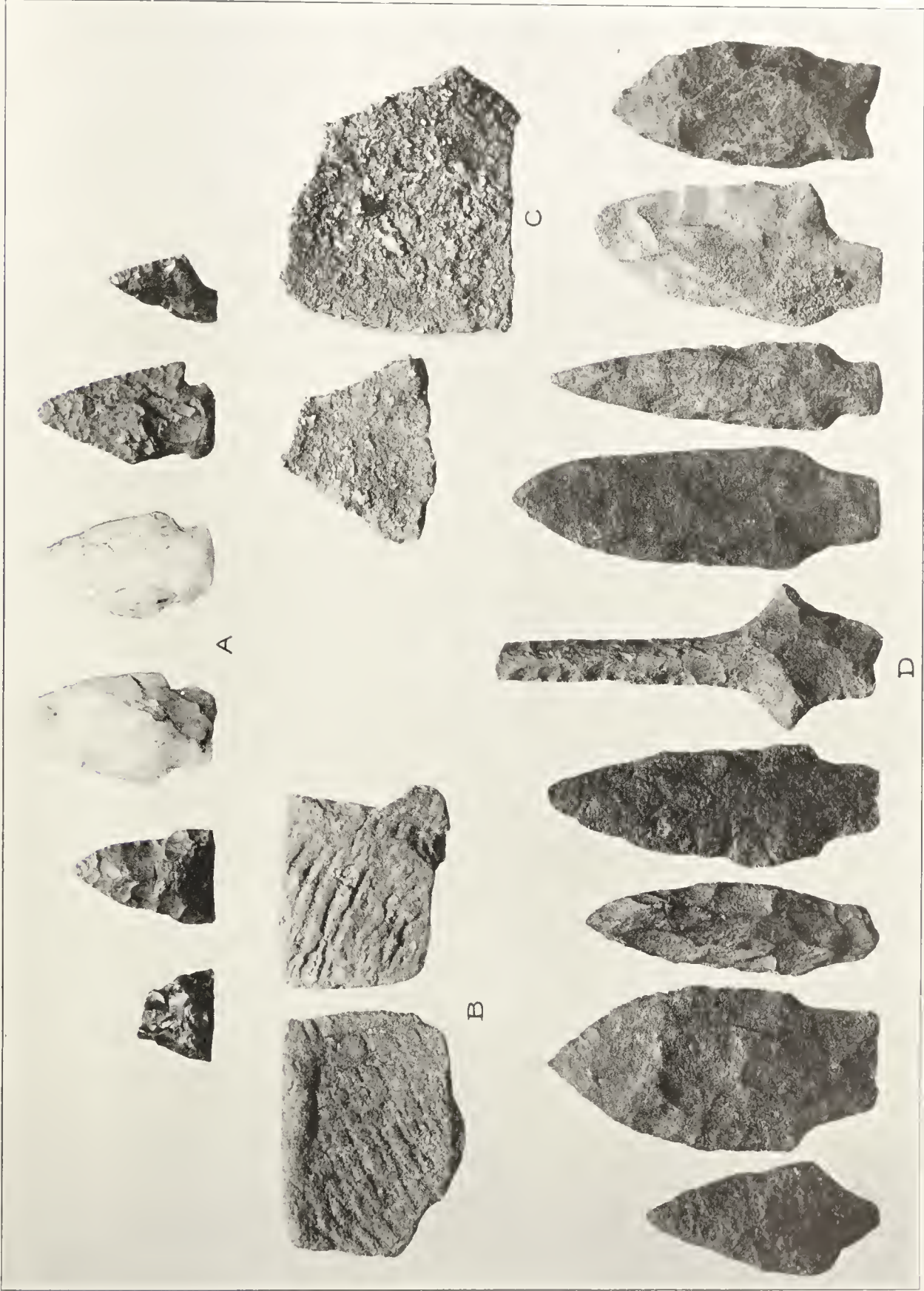
IMPLEMENTS FROM LOWEST LEVEL



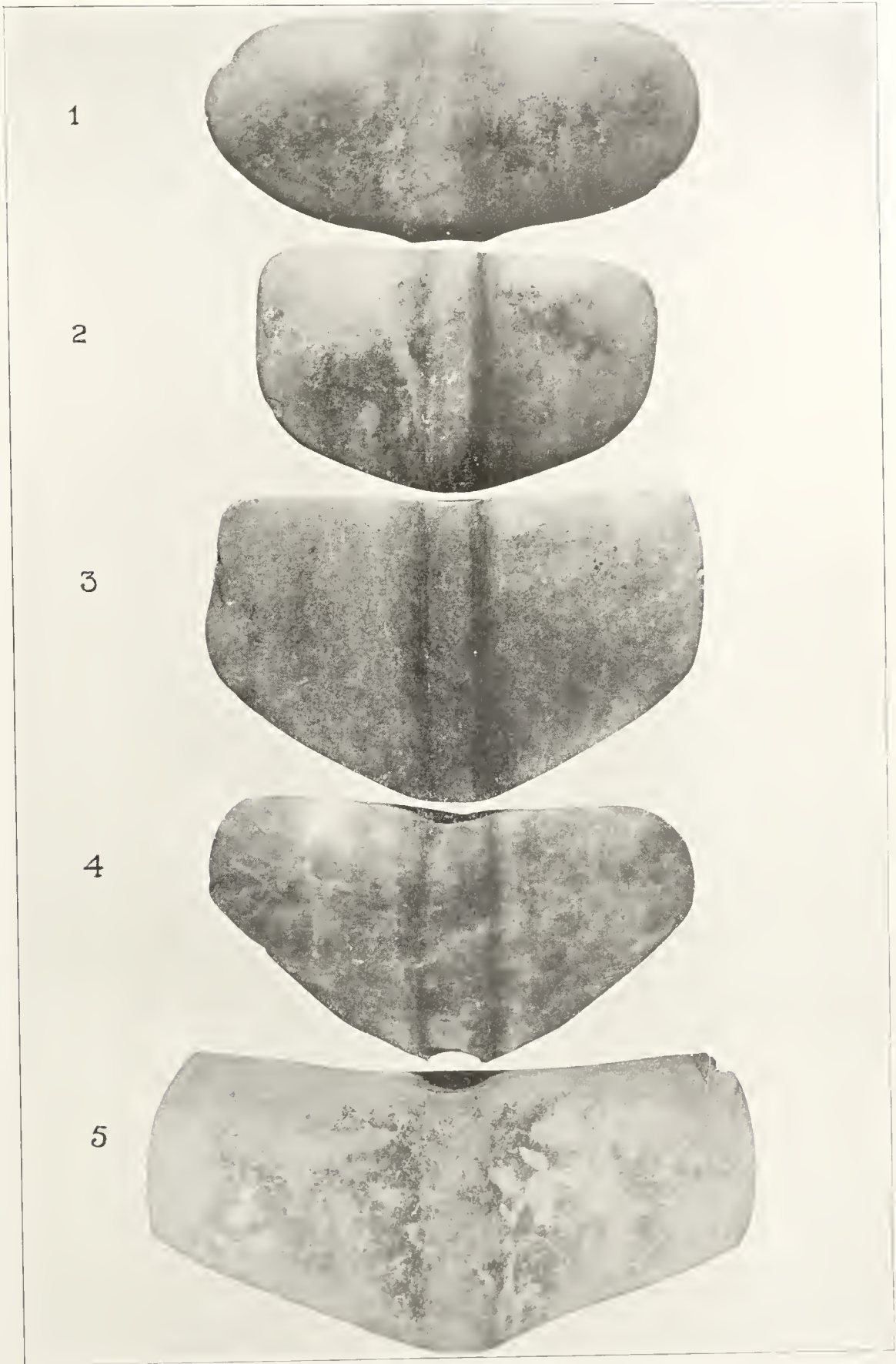
IMPLEMENTS FROM LOWER AND UPPER LEVELS



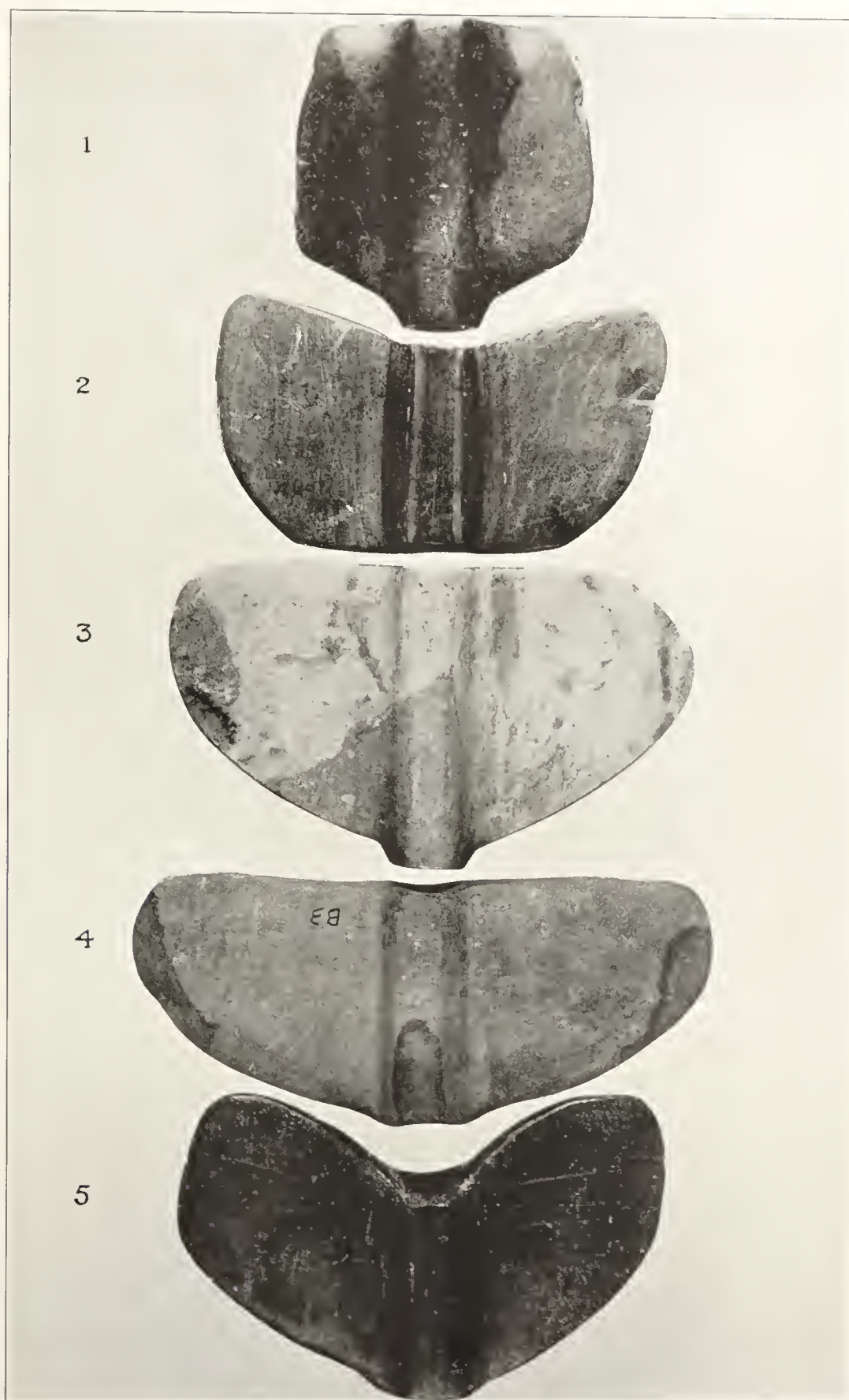
IMPLEMENTS FROM LOWEST LEVELS



INTERMEDIATE AND MODERN MATERIAL



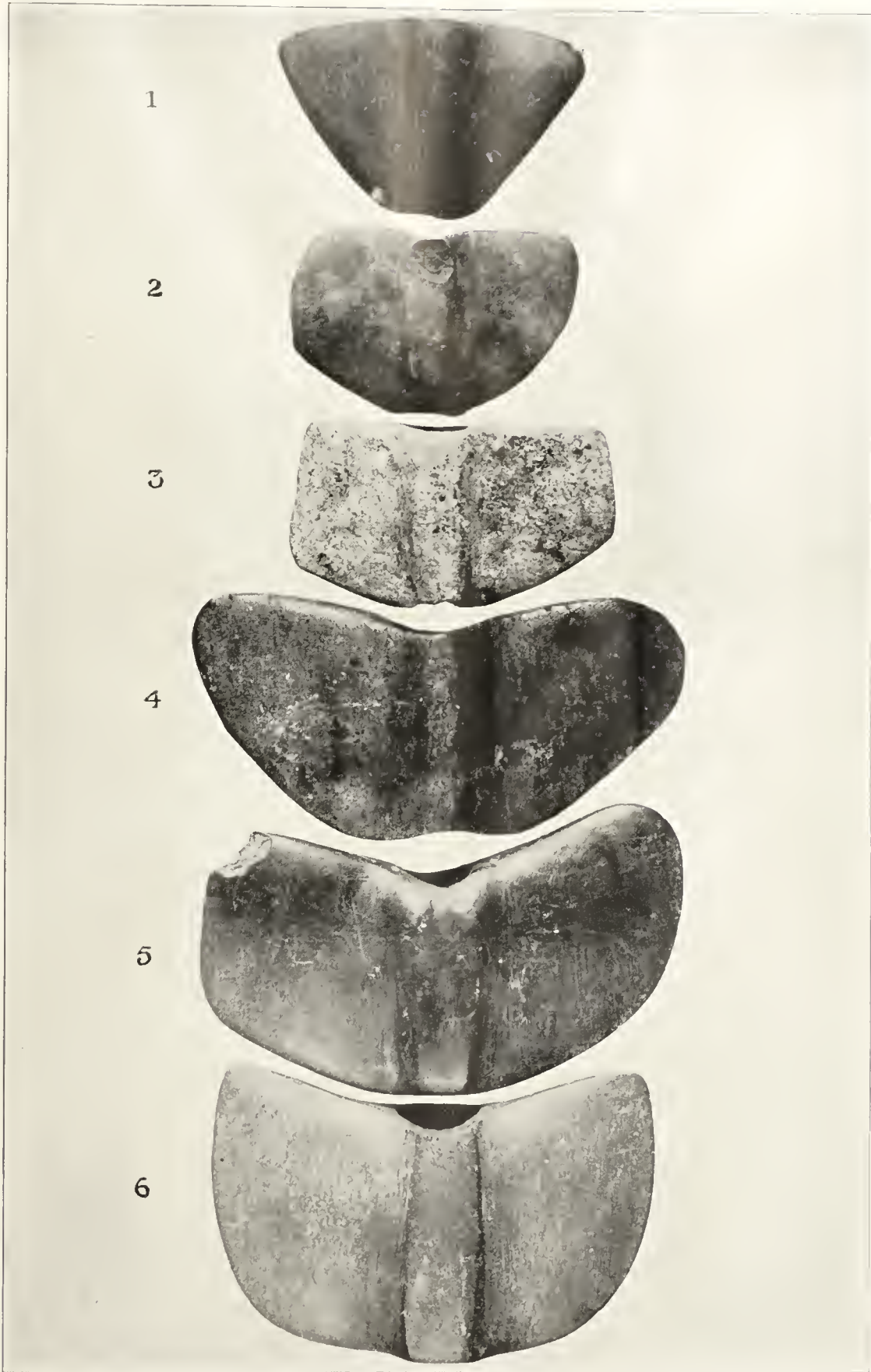
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